FUEL SYSTEMS

Any modification of Fuel Tanks, Lines, Hoses or Connectors is the complete responsibility of the Second Stage Manufacturer. The responsibility for determining compliance to F/CMVSS 301 regulations is that of the Final Stage Manufacturer.

To verify F/CMVSS compliance, vehicle testing may be required. Questions regarding compliance with F/CMVSS regulations should be directed to your legal counsel, the National Highway Traffic Administration or Transport Canada.

> WARNING: Always refer to the Ram Service Manual before servicing any portion of the fuel system. Fuel rail pressure must be released before opening any fuel system. Welding around or near fuel system components is not recommended. Shield or remove components as required to protect them from heat and weld splatter.

Modification of the fuel tank, its location, lines, hoses, evaporative systems can affect F/CMVSS 301 system compliance. **If the Final Stage Manufacturer modifies any portion of the fuel system, they assume the full system responsibility.**

FUEL FILL SYSTEM

Use of fuel fill kits as provided by Ram Trucks is recommended.

> CHASSIS CAB: 52121693AD

Fuel Fill system installation is the responsibility of the Final Stage Manufacturer. Install components in areas not affected during impact conditions. Ensure no fuel vapors can enter vehicle interior during fill or general operation. Any metal fuel fill mounting structure must be grounded to the vehicle chassis.

> NOTE: All fuel system components must be mounted securely for possible impact situations. Avoid contact with vehicle chassis. Keep system components away from sharp edges to avoid possible chaffing or cutting during an impact.

AUXILLARY FUEL PORT

An auxillary fuel tap is provided on gas and diesel fuel tanks to provide fuel for secondary power systems. This is located on top of the fuel pump module and is sealed with a connector. It is designed with barbed end to accept a hose and clamp. This system will not drain the vehicle fuel completely. There will be sufficient fuel to drive back from the worksite.

Utilize due care when installing a secondary fuel system. Install a check valve in line to prevent OBD11 system faults. Installing a secondary fuel port may affect the vehicles ability to comply with F/CMVSS 301 (gasoline engines ONLY). Refer to the fuel tank filler pipe location attachment section for a picture of the port. **Final Stage Manufacturer assumes all responsibility for fuel system modifications and system compliance.**

EXHAUST SYSTEMS

Modifying the exhaust system is not recommended as it may affect F/CMVSS emissions certification. Do not remove any original equipment exhaust system components. Never add components to the system that increases back pressure. Do not remove OEM clamps or hangers. Final Stage Manufacturer assumes all responsibility for exhaust system modifications and system compliance.

6.7 Cummins Diesel

Cummins Ram 6.7L Chassis Cab engine is integrated with a Diesel Particulate Filter Aftertreatment System for EPA Certification. The Diesel Particulate Filter assembly consists of a diesel oxidation catalyst, a diesel particulate filter, and temperature and pressure sensors integrated into a modular housing.

When removing the exhaust pipe for PTO installation it is recommended that the exhaust pipe clamp (PN: 52121859AD) and gasket (68071676AA) be replaced.

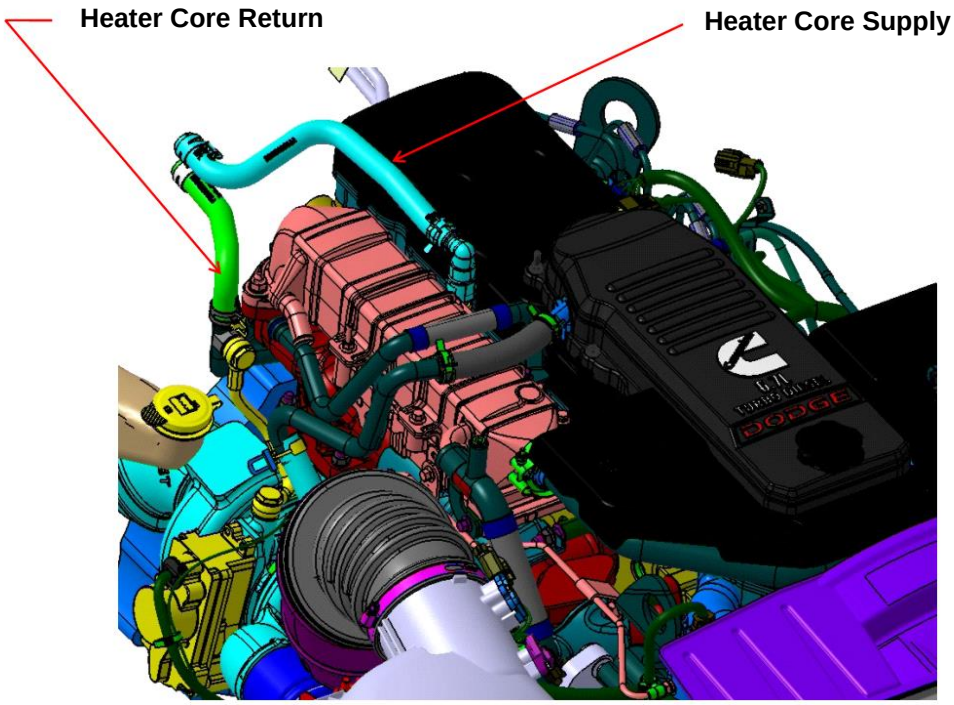
- **Body Builders must not modify or relocate this assembly, or any components associated with it. Also there should be no modifications made to the exhaust from the turbo outlet to after the muffler.**

NOTE: Never remove heat shields provided as original equipment. It is also the Final Stage Manufacturers responsibility to install appropriate shielding to any secondary body or equipment installed onto the Chassis Cab. **Final Stage / Individual Manufacturers assume all responsibility related to modifications performed.**

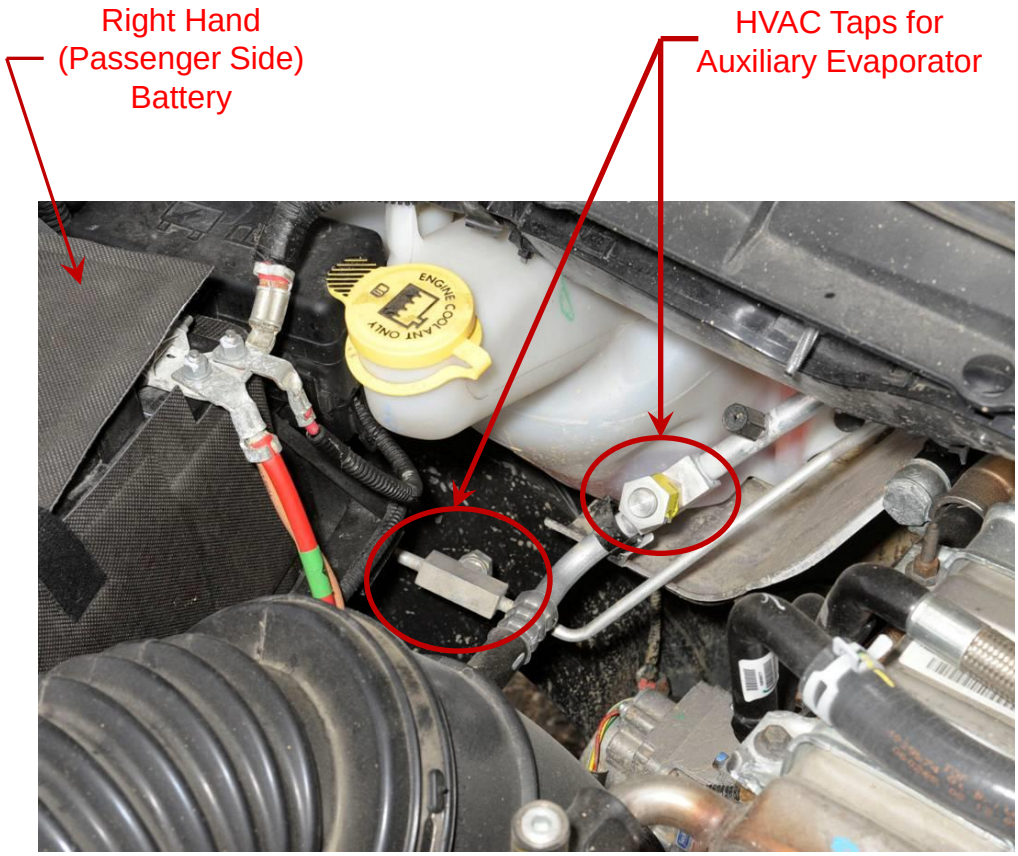
COOLING SYSTEM

Do not modify original equipment cooling system, fan, fan clutch, hoses and routing or the shroud. Do not install secondary equipment that blocks the grill opening forward of the radiator. Doing so could result in unsatisfactory cooling system performance. Refer to a Service Manual for proper system fill procedures and service.

Heater lines



The above photo shows location of the heater hoses at the passenger side rear of engine and designates which is the supply and which is the return.



Here are the AC taps that are part of the Ambulance Prep Package (AH2)

New tap locations coming in 2013

Liquid line:

- 3/8" tube-o fitting
- Male threads on tee fitting: 5/8 – 18 UNF – 2A
- Female threads on anodized aluminum nut: 5/8 – 18 UNF - 2B
- O-ring HNBR: 7.37 mm ID X 1.81 DIA cross section

Suction line:

- 5/8" tube-o fitting
- Male threads on tee fitting: 7/8 – 14 UNF – 2A
- Female threads on anodized aluminum nut: 7/8 – 14 UNF - 2B
- O-ring HNBR: 12.93 mm ID X 1.86 DIA cross section

CAUTIONARY NOTES TO BODY BUILDERS

To provide a safe and serviceable vehicle to the customer, certain precautions must be observed to ensure correct assembly and construction of the finished vehicle.

1. Do not revise tubes or hoses as service systems' performance may be seriously impaired.
2. Locate body cross sills to avoid interference with chassis parts, fuel lines or fuel gauge tank sending unit.
3. Body interior layout, body structure, accessory installation, water and holding tanks, fuel and propane tank, and motor generator locations should be designed to provide equal side-to-side loading on chassis to avoid vehicle lean and adverse effects on vehicle handling. The combined weight of the chassis, plus all items installed by the body builder, and an additional load allowance for reasonably anticipated passengers, liquids, luggage, and other equipment should not exceed the gross vehicle weight for which the particular chassis is designed, and the weight should be distributed between the front and rear axles so the maximum capacity rating of each axle system is not exceeded.
4. Undercoating or sound deadening material should not be sprayed on any chassis, power train or suspension parts. Hardware that requires special care includes such items as electrical wiring, radiator, engine, accessory drive, transmission, prop shaft, steering mechanism, springs, shocks, exhaust systems or linkages.
5. Use caution when installing the body near the diesel exhaust fluid (DEF) pump and lines. These components are susceptible to damage during installation if applied bodies are dropped on them. Repairs due to damage will be the responsibility of the final stage manufacturer. The part numbers for the fittings and o-rings are: Inlet Port – 68087316AA Return Port – 68087336AA Outlet Port – 68087315AA O-Ring – 68086587AA

PTO INSTALLATION ON G56 6-SPEED MANUAL TRANSMISSION

When installing a PTO unit on the G56 it is critical to follow the PTO manufacturer's installation instructions, particularly regarding use of the correct gasket and additional fluid fill quantity. For 2011 and beyond, the correct transmission oil fill is 5.1 quarts (was 6.1 quarts in previous years). With a PTO installed the correct final fluid level is between 1/2" and 1/4" from the bottom of the fill hole.

SPARE TIRE

Chassis Cab (box-off) models do not include the winch, spare tire and spare wheel, however, the spare tire and wheel can be ordered as an option (sales code TBE).

NEW VEHICLE STORAGE

Protection of new vehicles from damage and deterioration prior to retail delivery is the body builder's and his dealer's responsibility as is any expense incurred as the result of such damage or deterioration.

1. Check engine coolant and antifreeze protection
2. After storage for more than 21 days the battery should be recharged for at a minimum of 24 hours. For long storage in cold temperatures, the battery should be disconnected, removed and stored at a temperature above freezing.
3. Inflate tires to recommended pressure
4. Place parking brake in "off" position
5. Observe necessary security precautions to avoid pilferage and vandalism
6. Keep windows closed, doors locked and trim covers intact and in position
7. Keep engine, steering wheel and cab back covers intact and in position when applicable
8. Do not use chalk or crayon on glass or painted surfaces. Scratches may result

Headlamp/Taillamp Circuit

Adding lamps to the headlamp/taillamp circuits without a separate relay may damage the electrical system. Please refer to the Lighting information in the following link: Lighting Capacity per Circuit

Lighting considerations – Cab Chassis

As built, the Cab Chassis provides combined rear turn/stop lamp lighting. A typical upfitter installation will remove the tail lamp assembly and replace it with one of their own. Care must be exercised to match the original equipment lamp loads so that proper fault detection by the electronic control module is maintained.

2015 Chassis Cab Design Recommendations/Cautionary Notes

Frame Alteration Information

The following section shows suggested guidelines on modification of Ram frames for various after market applications.

***Caution*:** *Use of proper safety equipment is recommended when performing any modifications or alterations*.

The following recommendations are consistent with industry standards:

Chrysler Group LLC doesn't recommend any modifications or alterations to the frame assembly. Modifications or alterations (i.e. hole drilling, welding, etc.) to the frame assembly are the responsibility of persons performing these modifications or alterations. Anyone altering the frame must assume complete responsibility for assembly, performance, reliability and compliance of applicable FMVSS requirements.

The following procedures and specific precautionary instructions are recommended for proper installation of special bodies and/or equipment on the Ram Frame. Failure to follow these recommendations could result in damage to the basic vehicle and possible injury to occupants.

Holes

Holes are not to be drilled in the top or bottom of the frame rails. Holes to mount out-riggers, brackets, and supports must be drilled in the web (vertical sides) of the frame rail with the following restrictions:

1. Hole diameter should not exceed 20 mm (0.75 in.).
2. Material between edge of hole and top or bottom of the frame rail must not be less than 40 mm (1.60 in.).
3. The minimum edge distance between any two (2) holes must be larger than twice the diameter of the larger hole.
4. Any thru-fastener that torques down on both external surfaces of the rail must use an internal spacer to prevent crushing the rail tube.
5. All holes should be drilled in the frame using appropriate drilling practice and safety precautions.
6. Avoid drilling holes near the fuel tank, fuel and brake lines and other lines and wires to avoid damage to them.

Welding

Prior to any welding, the following must be done:

1. Avoid welding near the fuel tank, fuel and brake lines or other components that may be damaged by the heat of welding. If it is necessary to weld near these areas, use wet cloths to cover these components. If it is necessary to remove the fuel tank, lines or other components, do it in accordance with applicable service manual procedure.
2. Components near the welding area which could be damaged by excessive heat must be removed or adequately shielded.
3. Disconnect the battery(ies).
4. Precautionary measures should be used to prevent electrical system components or wiring damage.
5. Frame e-coating must be removed from the welding and surrounding area.

Use proper welding techniques to avoid stress risers that may adversely affect frame performance.

After welding:

1. Carefully inspect electrical components and wiring for shorts or other damage.
2. Apply protective coating to areas where coating was removed.

Dodge Fuel Fill Tube Kit

A new fuel fill housing will be included in box-off models and has been designed for easy installation (external flange mounted) and to insure proper fuel tube fill angle of 37°. Included in the kit are installation instructions, various fill and vapor hoses that can be cut and assembled per body applications, hose clamps, ground strap, and a hose connector. A DIESEL or GAS fuel label will also be included depending on application. The part numbers for the kits are:

Chassis Cab: 52121693AD

Installation Suggestions

- **Always mount the fuel fill housing as high as possible and route the fuel fill tube on a continuous downward slope (approx. 37°) to insure good fuel fill quality.**
- Mount the fuel fill tube upper housing with the vent tube at the 9:00, 12:00 or 3:00 position.
- When routing the vent tube, make sure there are no dips or sags. It should have a downward slope from the "fuel filler tube upper" to the fuel tank vent nipple. Tie strap it to prevent any sags that may accumulate fuel in the hose.
- **Always connect the ground strap from the fuel fill upper to the frame. This is a must! If the ground strap is not attached Electro static build up could occur during refueling.**

Body Mount Guidelines for Ram Box Removal or Delete

The following section shows suggested guidelines for Body Mounts for Ram 2500/3500 applications.

Caution: *Use of proper safety equipment is recommended when performing any modification or alterations.*

2015 Chassis Cab Design Recommendations/Cautionary Notes

The following section shows suggested guidelines for Body Mounts for Ram 2500/3500 applications.

Caution: *Use of proper safety equipment is recommended when performing any modification or alterations.*

These guidelines apply to second stage manufacturers who mount a body to the Ram Pickup Truck. This applies to trucks which have been ordered from the factory with the box deleted or those where the factory installed box is removed after delivery.

- The mounting location brackets on the chassis that are used for the pickup bed mounting should be utilized for installing the new body. On the short bed there are six mounting location brackets and on the long bed there are eight.
- Grade 10.9 M12 Fasteners (or equivalent) should be used. Torque to 60 ± ft-lbs.
- With the body in position the gap between the body mounting points and the chassis mounting brackets should be minimized to assure that there is no distortion of the chassis mounting brackets when the body mounting fasteners are torqued to specification. Metal spacers are recommended in cases where the gap exceeds 2 mm.

Since the guidelines might not be appropriate for every application of a body installation, following the guidelines listed above does not eliminate the responsibility of the second stage manufacturers to certify to compliance to FMVSS and CMVSS standards.

The final stage manufacturer who installs a second unit body on the chassis is responsible for compliance with FMVSS/CMVSS 204(1), 208[2], 212[3], 214(3)(4),219(3), and 301(3) Federal Regulations. Questions regarding compliance with FMVSS/CMVSS regulations should be directed to your legal counsel, the National Highway Traffic Safety Administration, or Transport Canada.

Body mounting Guidelines for Ram 3500/4500/5500 Chassis Cab

These guidelines apply to second stage manufacturers who mount a body to the Ram Chassis cab. There are figures in the dimensions/frame and exhaust section that show pierced holes that are provided for shear plate attachment.

Body mounting Details

1. The applied body should be mounted a minimum of 3 inches away from the rear surface of the cab as measured at the center of the cab.
2. U Bolt attachment in the transition area of the frame i.e. the area behind cab where the frame transitions from a deep section to a narrow section is not recommended. Shear plate holes are provided in this area. The 84 CA frame does have a straight frame area beyond the transition where U bolts are allowed.
3. At the rear of the frame there are several options. Two shear plate holes are provided at the rear of the frame as shown in the dimensions/frame and exhaust section. These holes may be combined with the pair of holes that attach the taillight. They can be enlarged to 21/32" like the shear plate holes if required. This can be used to attach the body as well as a bumper/step/trailer hitch bracket. In addition, space is provided at the rear of the frame for U bolt access. There are relief areas at the corners of the rear fuel tank to allow U bolt installation with adequate clearance to the fuel tank.
4. Shear plates at the front attachment should be angled forward 45 to 60 degrees from the horizontal. This is easily done by centering the shear plates on the two frame shear plate holes and angling them forward.
5. Shear plate holes are sized to allow the use of 5/8 inch diameter fasteners. Grade 8 or higher fasteners should be used with hardened washers. They should be torqued to 65 ft/lbs.

The final stage manufacturer who installs a second unit body on the chassis is responsible for compliance with FMVSS/CMVSS 204, 208,212,214, 219, and 301 Federal regulations. Questions regarding compliance with FMVSS/CMVSS regulations should be directed to your legal counsel, the National Highway Traffic Safety Administration, or Transport Canada.

Park Brake System

The park brake cables are routed to provide the most efficient system possible. When up-fitting, do not modify, alter or re-route the cables. NOTE: If the cables are modified from their OEM positioning, the final stage manufacturer would be responsible for recertifying the vehicle to FMVSS 105.

If the up-fit has structure (brackets, bolts, etc) that requires the same space as the cables, try to protect the cables and their routing. In both the park brake applied and release positions, the cables cannot be pinched, have movement restricted, moved or held out of their location. The cable strand (silver in color) cannot be covered with a foreign substance (paint, e-coat, underbody coating, etc) within 3" (75 mm) of the front cable frame bracket and within 3" (75 mm) of the front of the tensioner (bent nail, threaded rod, and bowtie equalizer). The cables and/or routing can be protected by using grommets, soft surfaces or other means that will not cause a rub condition. Cables should not rub on any surface as this could potentially

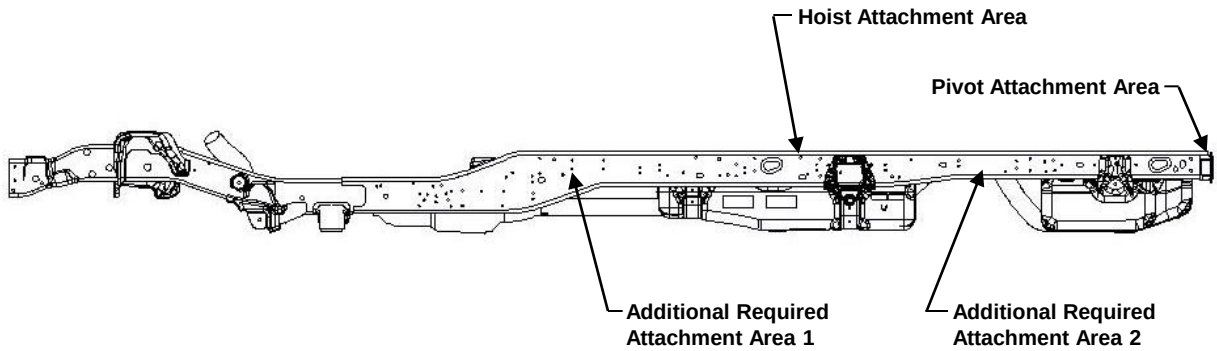
cause damage to the cable and possibly degrade or impair parking brake performance.

Also note: The tensioner (bent nail, threaded rod, bowtie equalizer) on the right rear parking brake cable moves forward in vehicle when the park brake is applied and moves rearward in vehicle when released. This is a conduit reaction system where the right cable must move forward when applied in order for the vehicle to park.

Dump Body Installation Requirements

Four attachment points are required for 4500 and 5500 models.

- The hoist and pivot attachment areas can use typical industry standard attachments.
- The additional required attachment areas require attachment only for control of the downward load. In other words, shear plates are not required. A spacer 2 inch x 2 inch that contacts the subframe and the top of the vehicle frame is sufficient.
- Attachment area 1 is just behind the cab in the front sheer plate hole area.
- Attachment area 2 is approximately at the centerline of the rear axle.


Hoist Attachment Area
Pivot Attachment Area
Additional Required Attachment Area 1
Additional Required Attachment Area 2

Up-fitter Cautionary Note

The frame has been designed to support in-service loads assuming that upfitter attachments will be made so these loads are evenly distributed over the length of the frame. This avoids concentrations of load in the frame due to incorrectly chosen or too few attachment locations which could lead to issues with frame cracking despite being within the overall chassis design load limits. Attention must be given to the quantity, location and method of up-fit attachment to the chassis/frame. Upfits with a heavily biased load distribution require even more attention concerning attachment to the frame in order to achieve an even load distribution.

Up-fit Attachment Design Guidelines

For adequate mounting and load distribution using spacers between the frame and the up-fit which follow the form and profile of the frame rail is advised. This assures that the applied body's loads are distributed along the frame and not concentrated where higher stresses could occur. Longitudinal spacers with a taper at each end should be used along the top of the rail between the up-fit's sub-frame components and the frame rail whenever possible as shown in **Figure 1 & 2**. Note: These spacers should have clearance in them at each rivet location to avoid bearing stress on the rivets.

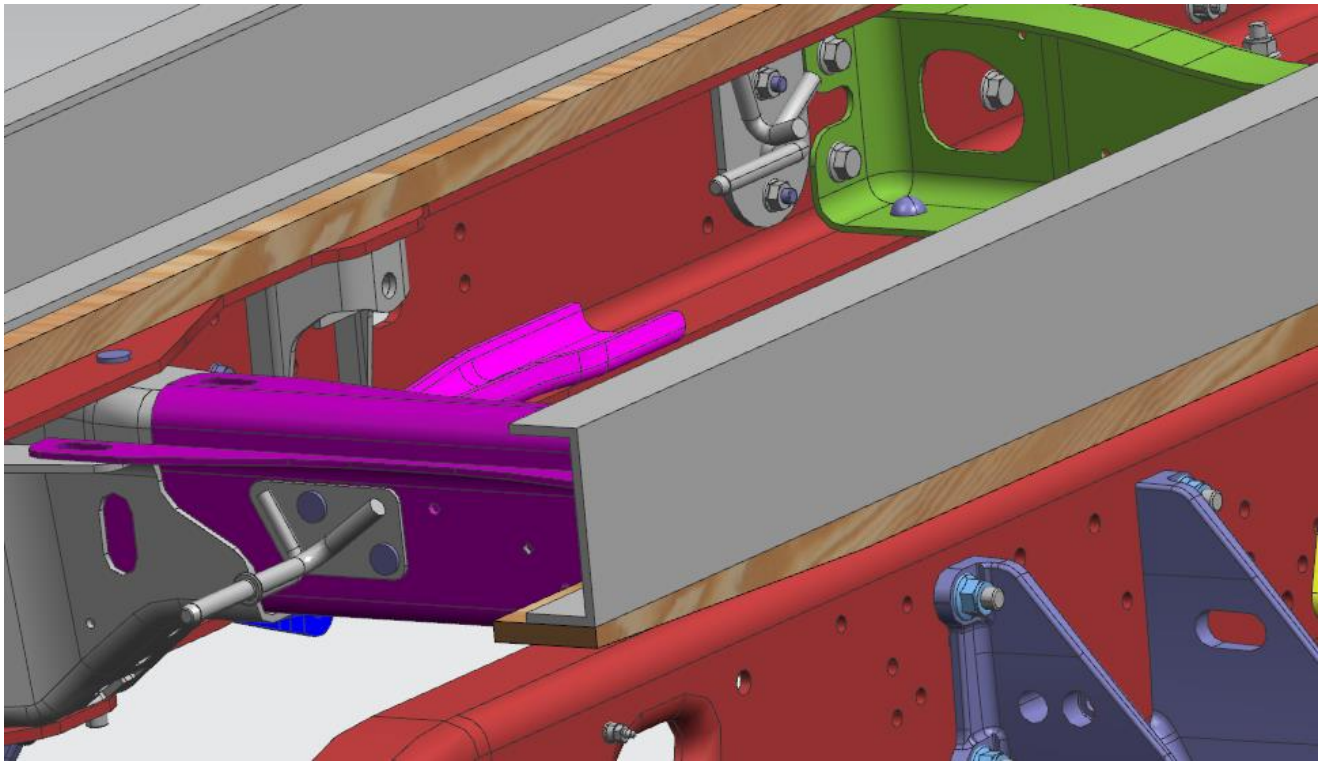


Figure 1

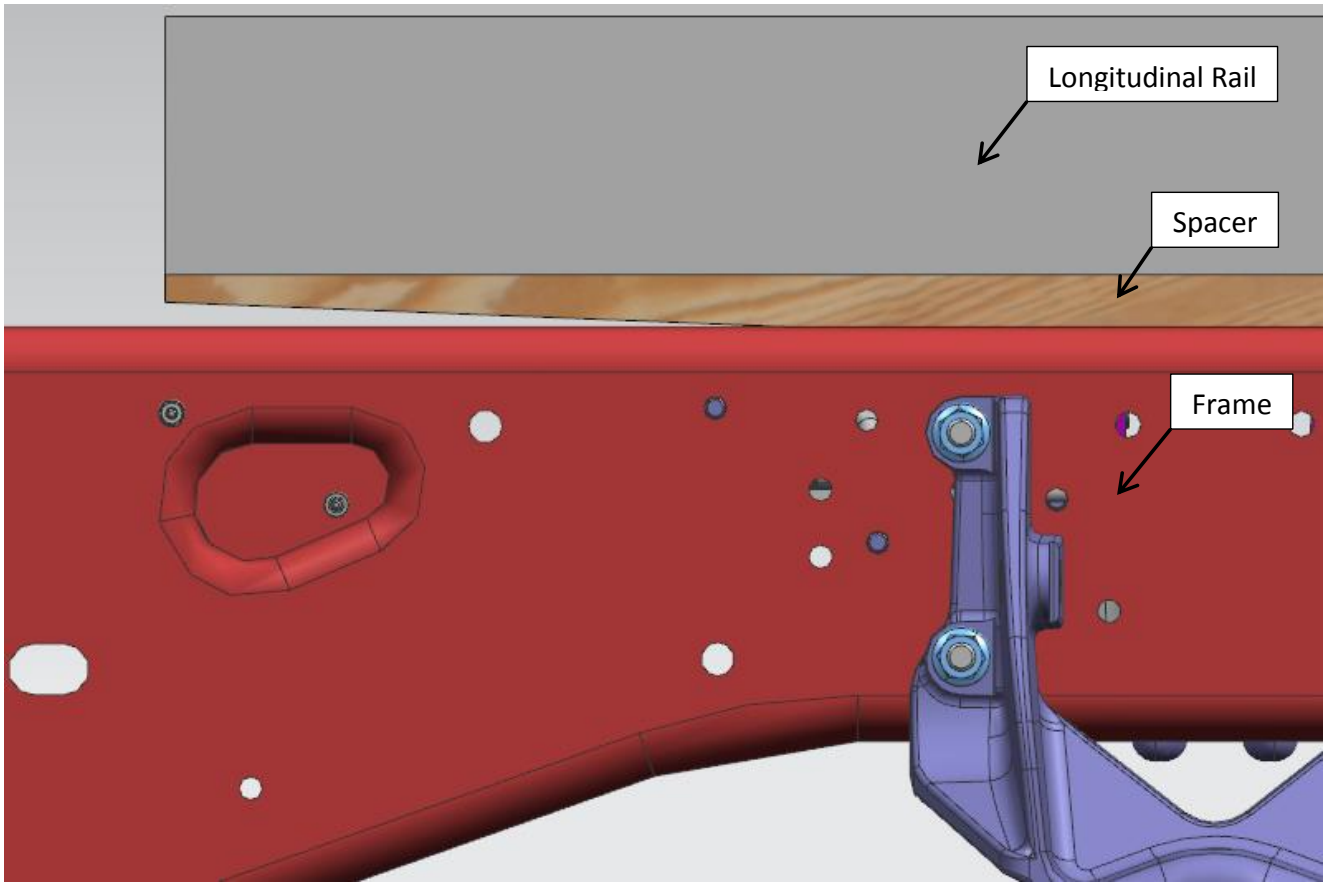


Figure 2

Multiple attachments between the up-fit body and frame are required to keep the up fit snug against the longitudinal spacer. Attaching the applied body at only the front and rear ends is not sufficient. A good common mounting practice is to attach every 18 inches where possible. If U-bolts are used as an attachment, at least one shear mount per side and multiple U-bolt attachments per side (depending on wheelbase) are required to keep the spacer and up-fit secure against the frame rail. If using U-Bolts for attaching the sub-frame to the vehicle frame, vertical spacer blocks must be installed between the upper and lower flange of the rail at the point of attachment in order to prevent damage to the flanges. Vertical spacer blocks must account for adequate clearance from all electrical or fluid lines installed along the rail. When using wood as a spacer, always ensure there is adequate distance or protection from exhaust system heat.

Note: do not use U bolts on any other location other than flat sections of the rail. If the rail is changing depth in the area necessary to attach, always use a shear plate. Critical zones to avoid U-bolt attachment are show in **Figure 3 & 4.**

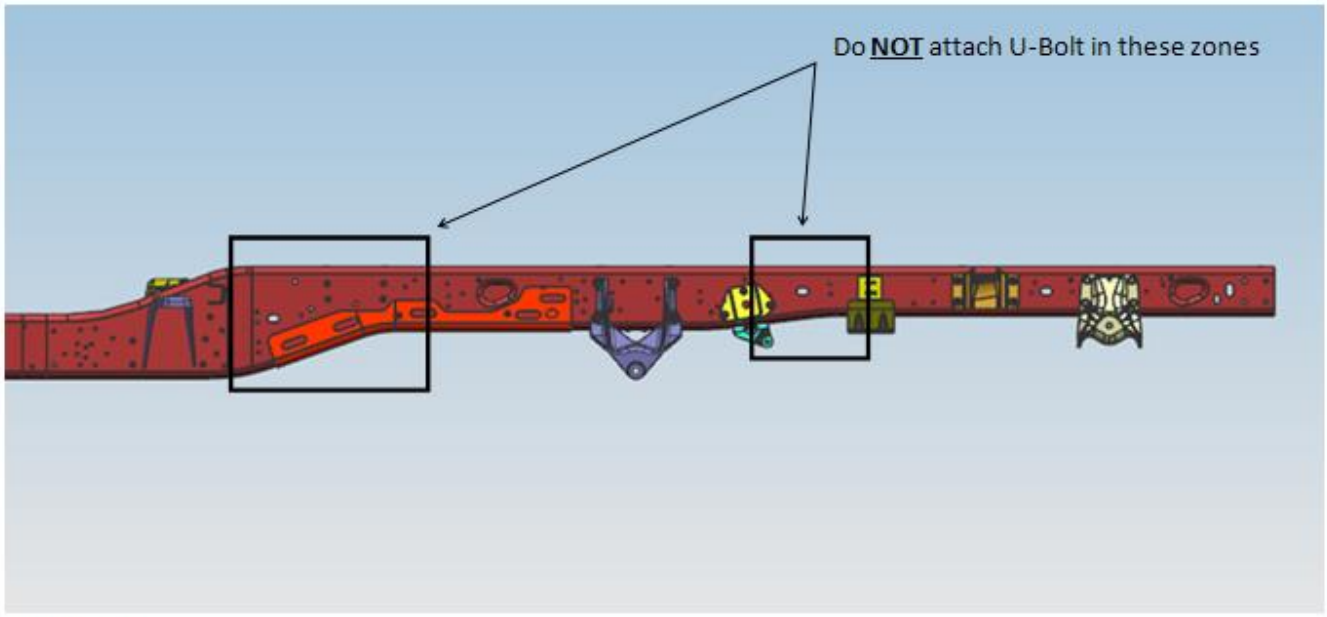


Figure 3

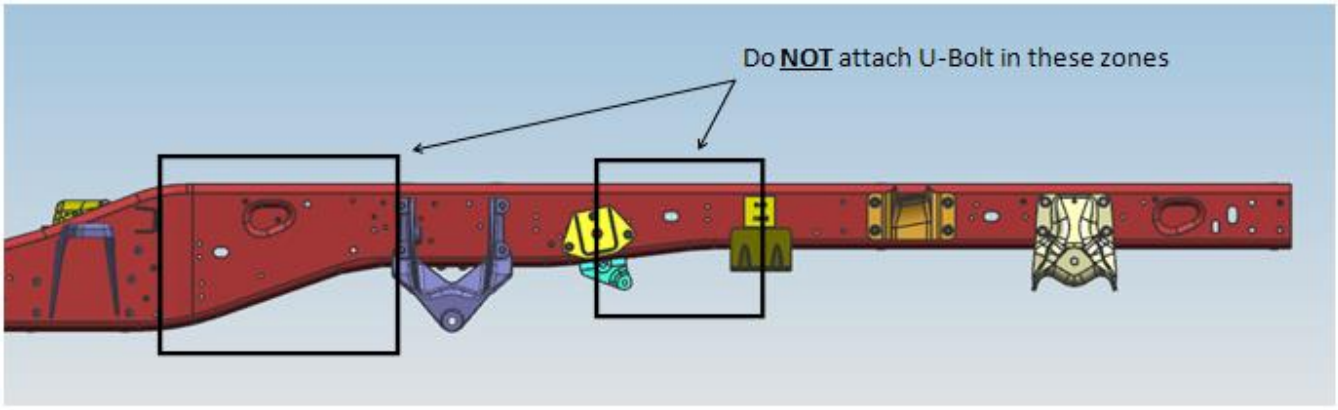


Figure 4

Though it is not recommended, where the use of a longitudinal spacer is not practical such as when the gap between the rail and up-fit sub-frame is too large, a minimum of 4 attachment locations per side are required along the rail to assure even distribution of load. An example of suggested attachment locations can be seen in **Figure 5**. These 8 attachments **cannot** be located in the areas of the rail outlined in **Figure 6**. These are the areas of the shock skive out reinforcement which is rearward of the front auxiliary spring pad bracket and forward of the jounce bumper bracket, as well as, the area that has 3 holes forward of the rear spring rear hanger. Efforts to provide longitudinal spacers in areas where clearance is not an issue should still be made.

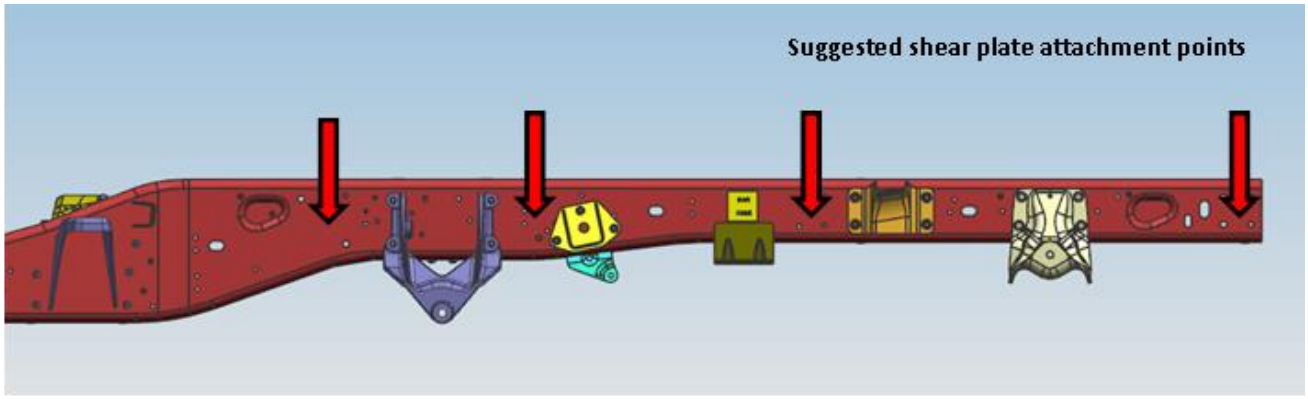


Figure 5

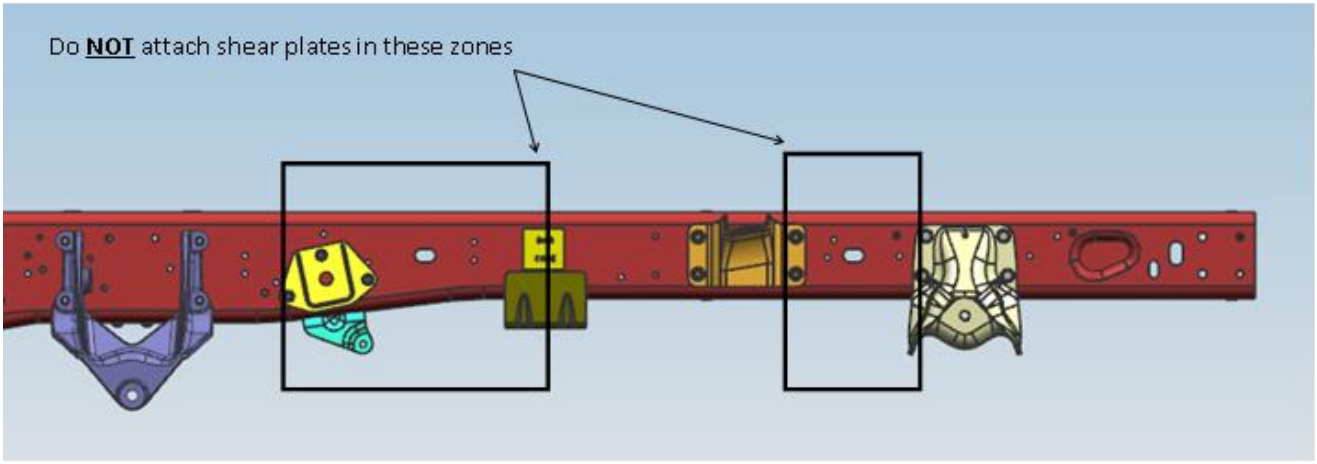


Figure 6